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ABSTRACT

A critique is offered of three papers on the student's role in learning. The first, by Robert Sternberg and Richard Wagner, makes connections between cognitive processing of information and the metacognitive processing of one's own approach to a situation and the information contained therein. The second, by Deborah Stipek, implies that metacognitive processing depends upon intrinsic motivation and may be stunted by structured extrinsic reinforcement. The third, by Walter Doyle, holds that evaluation and control pressures in classrooms are detrimental to intelligence and motivation to learn. Each paper is synthesized and a set of recommendations is offered for the redefinition of the student role in learning. Four approaches are discussed: (1) build on the foundations of direct instruction; (2) distinguish short-term and long-term values of learning; (3) develop student capacity for self-management of work; and (4) ground higher-order learning on ideals and exemplars. A discussion is presented of the work conditions required for teachers to implement the sort of curricular ideas suggested in the papers, focusing on management of teachers' agendas, resources, and incentives. Implications for school administrators and policy makers are considered. (JD)

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Intelligence, Motivation, and Academic Work:

An Operations Perspective

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This paper was commissioned by the National Commission on Excellence in Education as a synthesis, integration, and critique of three papers: "Understanding Intelligence: What's in it for Educators?" by Robert Sternberg; "Academic Work," by Walter Doyle; and "Motivating Students to Learn: A Lifelong Perspective," by Deborah Stipek. The opinions expressed in this paper do not necessarily reflect the positions or policies of NCEE or the Department of Education.

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The three papers prepared for the National Commission on Excellence in Education provide a solid foundation for conceptualizing the student's role in learning. Robert Sternberg and Richard Wagner's paper, "Understanding Intelligence: What's in it for Educators?" (1982) reviews theory and research that support a view of intelligence as the processing of information necessary for "purposive selection of and adaptation of real-world environments relevant to one's life" (p. 18). The breadth of this paper makes it difficult to summarize, but I would emphasize the careful connections made between cognitive processing of information and the metacognitive processing of one's own approach to a situation and the information contained therein. This connection seems to be related the central point in the second paper under consideration, Deborah Stipek's "Motivating Students to Learn: A Lifelong Perspective" (1982). Stipek emphasizes that learning requires "conscious and deliberate effort" (p. 4); such effort presumably involves shaping one's approach to a learning situation. Stipek implies that metacognitive processing depends heavily on intrinsic motivation and may be stunted by prolonged exposure to learning situations with structured extrinsic reinforcement. The implication of these two papers, then, is that schooling that relies on external reinforcement of learning will hinder the development of intelligence.

Walter Doyle, in the third paper under consideration, "Academic Work" (1982), makes a transition from the abstract and technical treatment of learning situations to the concrete reality of classroom work assignments. His main thesis is that the evaluation and control pressures in classrooms are inimical to intelligence and motivation to learn in that those pressures tend to confine teacher-student interactions to lower-order cognitive tasks and shift attention from the purposes of learning to the purposes of managing the performance-grade exchange. Cumulatively, these papers constitute a devastating critique of the

intellectual and motivational outcomes of schooling.

My attempt to integrate the papers by Sternberg and Wagner, Stipek, and Doyle is guided by a research paradigm of the organization and management of work in schools (Duckworth 1981, 1983) I have developed for the Center for Educational Policy and Management (CEPM) at the University of Oregon. The paradigm synthesizes research findings about classroom work processes that predict student achievement in order to indicate points of dependency on or potential intervention by school administrators. I will try to summarize what I have learned from these papers and offer some recommendations for the redefinition of the student work role with respect to the higher-order learning objectives at issue. I will also try to draw some implications for changes in the conditions of teaching that may be necessary to create such a student role.

Like Stipek and Doyle, I conceptualize the student role in terms of the work performed--work defined as purposeful effort or activity on the learning task. Student work, in my view, results from the interaction of three general work conditions--agenda, resources, and incentives. Each of these conditions is determined in turn by the student's background, current school experience, and life prospects. I am primarily concerned with the school's organization of "schooling" experiences (Bidwell and Kasarda 1980) or encounters with particular learning tasks. Sternberg and Wagner point out the possible counterproductivity of a student work agenda defined in terms of expected performance on psychometric tests, because the work required to move from one to another plateau on such tests is not easily determined. Furthermore, Sternberg and Wagner caution against an uncritical definition of work agenda in terms of Piaget's cognitive stages, because again the relationship between work and progress from one stage

to the next is not clear. The information processing view of intelligence is much richer in implications for the design of work operations to be performed. Doyle, however, points out that the actual work agenda experienced by the student is distinct from the work agenda built into the formal curriculum, and I see the reconciliation of these two work agendas as the major task for those interested in redefining the student role in learning.

With respect to work resources for learning, the authors of the three papers are in agreement that time on task by itself is an empty concept, although research on direct instruction (e.g., Fisher et al. 1980) seldom rests on this concept alone but instead qualifies it in terms of agenda (the focus of the task) and the resources of the student's entry-level skills. There is an interesting tension between Sternberg and Wagner's implication that learning requires the resource of self-management skills and Doyle's assertion that students tend to pressure teachers to simplify tasks until they can be performed virtually effortlessly with the resources at hand (text material, lists, formulae). It may be that increasing student self-management skills is prerequisite to the introduction of higher-order learning tasks; certainly the extension of learning tasks into real-world environments (Sternberg and Wagner) and independent study (Stipek) requires such student work resources if the organizational performance-grade negotiations (Doyle) are not to trivialize the academic expectations of such learning tasks.

Stipek addresses the matter of work incentives most directly in her argument that intrinsic motivation is the only reliable basis for work. Yet this assertion is incompatible with the emphasis in Sternberg and Wagner on coping with real-world environments. Surely, the ability to function in a system of external reinforcements would be an essential dimension of intelligence in their

sense. Moreover, Doyle suggests that students in a classroom will scan and interpret ecological cues regarding rewards and penalties for work; to ignore such sources of motivation in the hope of making learning an internally-reinforced process may be to attempt to deny the social being of the learner. On the other hand, there is no denying the dysfunctional consequences of many of the external reinforcements serving as incentives for student work in today's schools. The solution may be to link the call for intrinsic motivation with the call for self-management skills; this will be developed below.

Constructive Criticism of the Papers

Rather than criticize details in these three fine papers, I will attempt to shape my disagreements, such as they are, into a set of recommendations for the redefinition of the student role that is sympathetic to the aims of the papers but points in some different directions.

1. Build on the Foundations of Direct Instruction. Running through the papers is the theme that direct instruction, despite its utility for basic skills and slow students, is inapplicable to the higher-order learning discussed by Sternberg and Wagner. I would suggest caution in drawing such a premature conclusion. There are decades of painstaking work behind the elaboration and validation of direct instruction strategies such as are described by Rosenshine (1979) and Fisher and colleagues (1980). Only recently, these strategies have been found to be productive in junior high school classes (Evertson and colleagues 1980) and in remedial reading classes in senior high schools (Stallings 1981). Given the greater technical difficulty in elaborating task designs for higher-order learning, it is not surprising that direct instruction research has not yet been successful beyond these cases. However, the increasing volume of con-

tent and the subtlety of codifying interaction strategies around the teaching of cognitive and metacognitive operations do not in principle obviate the utility of the basic functions of diagnosis, prescription, focused presentation, monitoring, and feedback in Fisher and colleagues' (1980) formulation of direct instruction.

There are, after all, broad foundations of factual and procedural learning in specialized domains of learning. The accountability and precision characteristics of direct instruction seem relevant here. With regard to cognitive processes, while students may benefit from developing their own learning algorithms, Doyle points out that these are sometimes erroneous. I suspect that imitation and rehearsal are useful for mastering--e.g.--logical operations such as geometric proofs, and direct instruction may have an important function here. Finally, although metacognitive procedures may seem more abstract and thus of a higher order than cognitive processes, they are not thereby unsusceptible to modeling and feedback. As an example, I would quote the sequence of executive processing steps in Sternberg and Wagner (1982, p. 14): "deciding upon the nature of the problem being confronted, deciding upon a strategy for task performance, and correctly interpreting external feedback."

However, while arguing that the work of learning at the higher reaches is still skilled work, I think that we can make some progress in supplementing the direct instruction model as needed by distinguishing among kinds of skills and their optimal development. Here, Charles Perrow's (1970) analysis of work in terms of the kinds of technical routines employed and their modification in light of exceptional cases may help. Perrow distinguishes among routine production, engineering, craft, and nonroutine production depending on the frequency of exceptions to conventional procedures and whether the searchfor alternative

procedures is analyzable or unanalyzable. Academic tasks (and the variety of real-life situations all students experience at one time or another) exhibit all these types. Students may develop the different skills necessary in different ways. In the case of tasks with many exceptions, while serial application of known procedures may be practiced by the student outside the supervision of the teacher, the efficient testing of procedures can benefit from direct instruction in each of the procedures. In the case of tasks with unanalyzable search procedures, however, full attention and the sorting of task clues may be best trained with the close supervision of direct instruction but without its detailed procedures and reinforcements. The teacher aims to heighten student awareness and checking of perceptions; students develop the capacity to contrive unique solutions partly in private thought but also partly by comparing their work processes and products with those of masters and intuiting and inquiring about more fruitful search methods. The human mind may still be superior, under certain circumstances, to any direct instruction program we have, and there is the danger of hobbling the adaptive subtlety of natural thought processes by trying to reduce them to components.

These sketchy ideas are presented in the hope of stimulating further thought about the nature of the skills we want in students and the classroom processes most conducive to the development of such skills. Attempts to adapt the tools we possess, like direct instruction, are preferable to reinventing the wheel.

2. Distinguish the Short-term and Long-term Values of Learning. While I share Stipek's worry about the long-term effects of the application of direct instruction's program-and-reinforcement sequence to learning, I worry also about romanticizing the role of intrinsic motivation in learning. The enthusiasm and

curiosity we find so delightful in young children's learning (and in the attitude of adults to new situations) may be limited motivational bases for learning in the domains of the school curriculum. Bereiter and Engelmann (1966) distinguished between "fun" and "work" stages of learning as the student moves from encounter with new content to mastery of new skills; they argued that practice, while necessary, is often boring, and that coping with the application of knowledge and skill to more difficult content, while sometimes challenging, can also be frustrating, especially at first. Getting through this "work" stage requires, initially, external control and, eventually, work habits of discipline and persistence. Lest these seem limited to basic skills, I would like to recall my own experience in college freshman writing, where the expressed purpose seemed to be to challenge the platitudes, generalities, sentimentalities, and non sequitur thinking that make up the spontaneous approach of many students to new situations. In other words, the immediate value of learning to an individual may be only intermittently correlated with the long-term value of learning, both to the individual and to society. Surely there are lessons to be drawn here from a decade or so of student-centered learning environments, about which Stipek is curiously silent. If we are interested in excellence, we are interested in the transcending of the self, and that can easily involve "work".

3. Develop Student Capacity for Self-Management of Work. Although direct instruction may continue to be a fruitful instructional technique and the long-term values of learning may stretch beyond the cruising range of the intrinsic motivation of the learner, a strong case can be made for increased self-management by students during the prolonged periods of individual work between direct instruction episodes. During this time, the agenda must be kept in sight, resources of time, quiet, and materials replenished, and incentives

internalized or managed through some sort of external reinforcement for the work of learning. Internalization is implied by Sternberg and Wagner's account of metacognitive processes, and the cognitive and motivational bases of such processes need to be elaborated in terms of the actual work activities of students in their life situations. Doyle's construct of mediating-processes-in-ecology is useful; we need to understand the strategies students use to make sense of and adapt to environments other than the classroom and then develop motivational and self-management techniques to sustain engagement with learning tasks in such environments despite the distractions.

We need to think realistically and pragmatically from the student's point of view about how the academic tasks described in these papers are to be integrated into the student's lifeworld rather than attempt to structure schoolwork so as to exclude some of the ecological influences (such as competitiveness) that we may dislike. This means articulating the variety of agendas, resources, and incentives students embrace regarding purposeful effort and activity and giving the student guided practice in making and following through on decisions about these options. This means confronting alternative attractions and developing willpower. If we accept Bereiter and Engelmann's argument about the work stage of learning, then we must train students in persevering in a task in the absence of direct supervision. We must also model articulation and advocacy of the larger values of learning so that students can acquire the skill of defining and defending their own learning purposes against teachers caught in Doyle's classroom management game.

4. Ground Higher-Order Learning on Ideals and Exemplars. The account of self-management given above, linked to the preceding arguments about the

possible utilities of direct instruction and the qualified importance of intrinsic motivation, lead me to emphasize the cultural values of learning and to think about their revival in the classroom. However, when I mention cultural values, I want to avoid the tone of seriousness that permeates some of these papers and has on past occasions characterized my own thinking about the student's role in learning. One can neglect the complementarity of fantasy and play to student intelligence and academic work. Sternberg and Wagner, for example, neglect the symbol-transforming operations of imagination that play an important part in insight and metacognition. However, fantasy and play need a richer milieu than the usual fare of adolescent recreation. The ideals and examplars in the culture served by schools are what I have in mind here. Among the models of skill and accomplishment available to students, surely heroic figures and benefactors of the culture have greater salience than teachers. To the extend that students fantasize about their own replication of such accomplishments, the school has a powerful base to motivate students' working to develop the skills employed by such figures. However, the validation of such achievement is as much external as internal. In the sense, I question Stipek's assertion that learning outside the classroom is free of external reinforcement. Social status is a powerful reward.

Students need a wider vision of their own status as student than the narrow task focus that is both current in schools and also is implied in the papers by Doyle and Sternberg and Wagner. I have articulated (Duckworth 1979) this wider vision in terms of the student as professional as opposed to the student as wage laborer. There is a danger, however, in retrojecting the "serious" attitudes of an adult academic towards intellectual work back into the minds of adolescents encountering such work for the first time. The prevailing thought patterns of

adolescent may in fact be idealism, fantasy, play, and humor. The ecologies for such thought patterns are well established in the modern consumer culture of adolescence; the establishment of alternate ecologies to shape idealism, fantasy, play, and humor around academic work is not impossible but requires considerable imagination.

Sternberg and Wagner's proposal for a curriculum of guided discovery through some of the great scientific advances is just such an imaginative flight, and its prospects are well attested by the recent popularity among adolescents of television series such as Carl Sagan's "Cosmos". For the wider group of students, the humanities and social studies seem a richer store of ideals and play. Some of this appears in Mortimer Adler's recent proposal for a classical education; his precursor in the advocacy of "paideia", Werner Jaeger (1965) gave central place to the Homeric epics in exemplifying and personifying the virtues of Greek culture in the minds of the youth of that society. To the argument that this is an elite educational method, I would respond that in fantasy and play, adolescents reveal a universal elitism. The particular exemplars who inform elite images today, however, tend to exhibit glamour and power rather than knowledge and virtue, and this may be a critical area of intervention. Acquiescence in the superficiality of popular culture may be a key failing in educators' adaptation to the world of the young. Until educators can present potent images of self-cultivation and socially-recognized accomplishment in learning and its productive consequences, all the technical efforts to design academic work around higher-order objectives may be in vain. However, the point of such intervention is to persuade the student to invest in the idealized image of the cultural exemplar, not to expect such investment by itself to carry the

student through the arduous periods of academic work.

The student role implied in these four recommendations can be characterized as follows: a continuity throughout schooling of structured group interactions with a teacher on the mastery of skills and content--including logical operations--deemed central to the culture of the society at large; increasing demands on the student to apply those central skills to new and varied content of increasing difficulty in an intelligent (in Sternberg and Wagner's sense) and self-disciplined fashion; and the gradual supplementation of mastery for its own sake with the imitation of cultural exemplars in pursuing higher-order learning.

Stipek might well argue that this structured emphasis ignores her critique of external reinforcement in schools. I agree that motivation to learn in today's high schools is indeed problematic. My solution, however, is not a proposal to reorient high school education to intrinsic motivation, but to defuse the situation for those students who otherwise would become bored in school by allowing them a respite from the academic regime of school during the <u>early</u> adolescent years. Upon completing their elementary school education, students would have the option of pursuing intrinsic motivation in a variety of supervised activities for a year or two, but they would have the foreknowledge that a demanding and externally reinforced four-year high school curriculum had yet to be completed before they could obtain a graduation diploma. The re-entry into the academic regime would then be as deliberate as society would tolerate, on terms well known and agreed to by students. The assumption behind this proposal is that the moratorium on the formal curriculum would provide space for the flowering of personal interests in learning without the school's obligation to control and evaluate such learning. My sense from interviews with school personnel is that this sort of moratorium is at present taken by high school gra-

duates after six years of progressively more alienated and unfruitful secondary schooling. The aim in the proposal is to provide the break in lockstep schooling earlier and then to redefine the adolescent's role as student anew and on terms of self-management and high expectation such as have been described above. This proposal is consistent with, but goes several steps beyond, the current philosophy of middle-school education.

The Management of School Work

The three papers under consideration, and my own discussion thus far, have focused on how to redesign the student's role to promote more advanced learning. Doyle does indicate the problematic nature of the teacher's role in establishing and sustaining such an altered student work role, although I think he focuses too narrowly on the internal world of the classroom and on the management of specific tasks. I would like to sketch the elements of a wider view of the determinants of the student's work conditions. If we are to identify interventions and points of access in improving outcomes of education, we need to understand the more distal but no less important systemic determinants of the work of both students and teachers.

The paradigm I have been developing at CEPM looks beyond the classroom to school and district management policies and practices. My remarks earlier about student self-management and idealism may serve to guide this exploration of the student role determinants that are dependent on the work of teachers, administrators, and other influential figures in public education.

Let me first consider the work conditions required for teachers to implement the sort of curricular ideas suggested in these papers. With regard to teachers, Doyle has indicated how student pressure can drive down the standards

of expectation for performance and trivialize comprehension tasks by reducing them to memory or procedure tasks. Against this pressure, how would administrators go about defining a work agenda of high standards and higher-order cognitive objectives for teachers, providing resources needed for more ambitious curricula, and creating and sustaining incentives for confronting students--e.g., for putting up with the tensions of noncooperation and friction about student nonperformance? Let me suggest some possibilities.

Regarding teacher work agenda, I agree with Sternberg and Wagner that really ambitious goals for student attainment need organization in their own right, although I would oppose the restriction of such goals of excellence to teachers of "gifted" students. Teachers of all students need to be reminded by administrators that mastery is to be expected of thinking skills as well as curriculum content. Stipek makes the point that excellence can be sought in terms of mastery at each stage of learning, although I would disagree with her advice about compartmentalizing and protecting different student learning groups from one another. The teacher needs a more flexible hand in stretching task capacities of different students and symbols of excellence to apply to the progress of each student (Stallings 1981). Building principals, other teachers, and supervisors can review a teacher's decisions regarding different students and suggest where goals are being set too low.

Regarding teacher work resources, administrators should recognize that rigidity in the time schedule and grouping arrangements may prevent teachers from attempting to use direct instruction in ways appropriate for a program of mastery learning for all students. Teachers who feel that they cannot assign homework and expect it to be completed are likewise discouraged. Teachers whose students are absent or late require assistance in reintegration and discipline

(Stallings 1981). Students who obstruct the progress of the class are a drain on resources (Canter 1976). Classroom discipline can be strengthened by school administrators (Purkey and Smith 1982).

Regarding teacher work incentives, Lortie (1975) has described how teachers value their personal relationships with students and derive diverse rewards from their accomplishments. Brophy and Good (1974) suggest that teachers may be differentially engaged with students. Some teacher seem to feel threatened by or useless to fast learners. Teachers, in their isolation, may be coopted by the student value system just as they are coopted by student negotiations over assignments. Incentives for teachers to give more attention to or demand more of all students might include recognition of exemplary student performance and products. Athletic and music teachers get this recognition and report pressure to obtain a quality product from students. Here, moreover, other students may reinforce teacher values about quality. Incentives for teachers thus may derive from new ways of linking student accomplishments to benefits (including a sense of school pride) or to providing a service to the community. Work, in short, can have a social-exchange value it seldom enjoys in school. The social utilities here are relevant to Sternberg and Wagner's call for relevance but include symbolic accomplishments and thus respect the value of the academic disciplines as sources of value to civilization itself. This sort of expectation-raising has been documented in elementary schools (Brookover et al. 1979); there is no reason to think it cannot be done in high schools as well.

The work of teachers and students is dependent in turn on the work of school administrators and policy makers. The improvements suggested by the three papers depend on the schools' ability to obtain authorization for such work

agendas, provision of resources, and confirmation of incentives. There has been much discussion of the public's dissatisfaction with schools and withholding of resources; Coleman, Hoffer, and Kilgore (1981) have justified the next step of exit from the public education system. Private schools are known to be responsive to their clientele, and they have a reputation for higher student performance, although there is doubtless great diversity in this respect. However, public schools with administrators who have articulated the value of school learning and assembled citizen coalitions in support of academic goals have managed in many cases to turn this situation around. Such administrators are not intimidated by public desires for immediate, painless, and superficial school productivity. There is a leadership function here with regard to reestablishing the contribution of education and excellence to civilization and to the quality as well as quantity of work done in various sectors of the society. It is the lack of this leadership that to me accounts for some of the criticism of the otherwise seemingly unexceptionable establishment of minimum competencies. It is not that such competencies are not important statements by schools, but that they seldom are accompanied by standards of excellence. Indeed, I witnessed a superintendent who wished to authorize such a set of standards for excellence frustrated by the principals of the district's schools on the argument that they had their hands full with the minimim competencies already.

The teacher's and student's work agenda, resources, and incentives are embedded in the societal perception of the school as an institution. Charles Bidwell (1979) has argued that schools are nested ecologies open to different sectors of the public, and this may account for the apparent lack of central organizational control regarding decline in performance standards.

Superintendents are in a position to notify these different sectors of the goals of the school and to protect principals and teachers when pressed by particular publics with special interests. In particular, the school's performance standards need protection from the credential-oriented students and parents described by Doyle and by Meyer (1979).

Superintendents are themselves hired by school boards, however, and need an external foundation for sustaining a drive for higher performance standards. Ultimately, it is policy-articulating bodies like state and national commissions and the universities that can provide the institutional support for schools' attempts to improve their standards and adapt their curricula to what we are learning about intelligence, motivation, and academic tasks. Without this support, the social forces that depress student performance will continue to hold sway.

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